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Recommended Citation

Kidd, Tandalayo; Lindshield, Erika; Kattelman, Kendra; Adhikari, Koushik; Muturi, Nancy; and Zies, Susan, "Ignite-sparking Youth to Create Healthy Communities: A Protocol for a Community-centered Effort for the Prevention of Adolescent Obesity" (2016).

Health and Nutritional Sciences Faculty Publications. 188.

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Ignite-Sparking Youth to Create Healthy Communities: A Protocol for a Community-Centered Effort for the Prevention of Adolescent Obesity

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Abstract

Objective: To observe outcomes of a community-centered approach to identifying behavioral and environmental factors that influence overweight and obesity in 6th-8th grade youth in selected low-income, racial/ethnic communities.

Design: Five-year, tri-state, quasi-experimental design with environmental assessments and a questionnaire measuring nutrition and physical activity knowledge and behavior conducted in all communities at pre and post.

Setting: Low-income, minority communities targeting 6th-8th grade youth.

Participants: One experimental and one control communities will be selected via each state's Cooperative Extension network through an application and review process with the random selection of participating communities.

Intervention(s): Academic institutions will work with community leaders to establish and help support community committees tasked to plan, implement and evaluate one nutrition and one physical activity intervention.

Main Outcome Measure(s): Assess environmental changes associated with increased intake and variety of fruits and vegetables; decreased intake of foods high in solid fats and added sugars; and an increase in physical activity among 6th-8th grade youth.

Analysis: Baseline and post environmental data and pre and post questionnaire data will be analyzed using t-tests, chi-square, and ANOVA with a $p < 0.05$ to establish statistical significance.

Introduction

A consensus is building among researchers that the obesity epidemic is driven by the environment, rather than solely by individual factors.[1-4] As Schwartz and Brownell noted, the gene pool did not change between 1970 and 2000, "yet the overall rate of being above the 85th percentile in body mass index (BMI) for children doubled in these years (from 15% to 30%), and the rates of being above the 95th percentile tripled (5% to 15%). Evidence reviewed supports the hypothesis that the environment is driving the changes in obesity rates [4]."

Powell et al. found significant inverse associations in low-income communities between the availability of food stores and adolescent BMI [5]. Furthermore, this relationship was three times greater among African-American adolescents than white or Hispanic adolescents. Additionally, a study of more than 200 neighborhoods found four times as many supermarkets in predominantly white neighborhoods as in predominantly minority neighborhoods. Sallis & Glanz reported that low-income racial/ethnic minority communities had less access to supermarkets and a greater concentration of fast food restaurants [6]. Availability of healthy foods, such as low-fat dairy products and fruits and vegetables, are often less and/or of poorer quality in the racial/ethnic minority and lower-income areas [7,8].

In addition to food access, research indicates that access to parks and other recreation facilities are fewer in low-income, low education, and racial/ethnic minority communities than neighborhoods with higher incomes.[5,9] A study in Austin, Texas showed that although predominantly Latino neighborhoods were more walkable than

high-income, mostly non-Hispanic white neighborhoods, the Latino neighborhoods had poorer safety ratings, maintenance, and aesthetics that may discourage residents from walking [10]. Given the findings related to limited healthy food outlets and physical activity opportunities, it comes as no surprise there are significant racial disparities in obesity prevalence among U.S. children and adolescents. [11].

Because the obesity issue is convoluted, the outside expert-driven research paradigm may not be the most efficient strategy [12]. The traditional approach to changing individual behavior through top-down knowledge transfer has not been effective in reducing the obesity rate. Research is beginning to demonstrate that holistic, community-based approaches that use local resources are the future of obesity prevention interventions [13-15]. Community-Based Participatory Research (CBPR) is a process that fosters community partnerships that allow investigators to work side-by-side with the target audience to understand, develop and create interventions desired by the target

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Citation: Kidd T, Lindshield E, Kattelman K, Adhikari K, Muturi N, et al. (2016) Ignite-Sparking Youth to Create Healthy Communities: A Protocol for a Community-Centered Effort for the Prevention of Adolescent Obesity. Int J Nurs Clin Pract 3: 189. doi: <http://dx.doi.org/10.15344/2394-4978/2016/189>

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audience [16]. The partnership provides the opportunity to uncover the background information and knowledge needed to understand the issues that are relevant to the target audience, followed by a collaborative development of an intervention strategy suitable to the target audience. Furthermore, this partnership strengthens relationships to conduct culturally sensitive and appropriate research with diverse communities. The result is increased community trust because researchers will be seen as responding to the perceived needs of the target audience [17]. Working with an existing entity such as Cooperative Extension reinforces essential components of community-based research. Extension personnel are integrated into their communities and have extensive experience in community-based programs serving low-income families [18]. Thus, Extension personnel can be a valuable resource for developing community-based interventions. Transitioning Extension's role to one of facilitator, rather than as the expert educator may be an effective strategy in the obesity prevention efforts.

The "Ignite-Sparking Youth to Create Healthy Communities" project proposes to use community-centered efforts integrating research and Extension to engage adolescent youth, parents, and other community members in identifying strategies to promote healthy eating and physical activity in low-income ethnic communities. The primary aim of this project is to determine if community partnerships developed via community-centered efforts will assist selected low-income racial/ethnic communities in creating an environment that will be effective and sustainable in preventing overweight and obesity among 6th-8th grade youth. The secondary aim is to determine if environmental changes will increase dietary intakes of fruits and vegetables and increase physical activity among 6th-8th grade youth in selected communities.

Methods

Study design overview

This project is a five-year, tri-state, quasi-experimental design with research scientists partnering with Extension personnel in each state to facilitate the designing and delivery of respective community interventions. One control and one experimental community from each state, six total across the three states, will be selected to participate and will be responsible for creating and implementing one nutrition and one physical activity program addressing overweight and obesity among 6th-8th grade youth in their community.

Baseline environmental assessments will be conducted in all communities by the researchers under the guidance of Extension personnel and community stakeholders based on the habits and presence of the target population. Next, focus groups on community perceptions, barriers, and knowledge of healthy eating and physical activity will be conducted in the three experimental communities. The last assessment component will be the development of a questionnaire given to adolescents and administered at pre- and post- program intervention in both experimental and control communities. All data collected by researchers will be presented back to the community in a timely fashion for their knowledge, use and ownership. During years two through five of the project, each community, control and experimental, will receive \$5,000 per year to implement at least one nutrition and one physical activity program. The Extension personnel in the experimental communities will be trained on the community partnership component of the CBPR model to facilitate the forming of a community steering committee. This committee will be made up of interested parents,

community members, and 6th-8th grade youth to guide the development and implementation of the intervention within their communities. However, the three control communities' intervention development and implementation will be facilitated by Extension personnel without CBPR training and researcher partnerships or guidance.

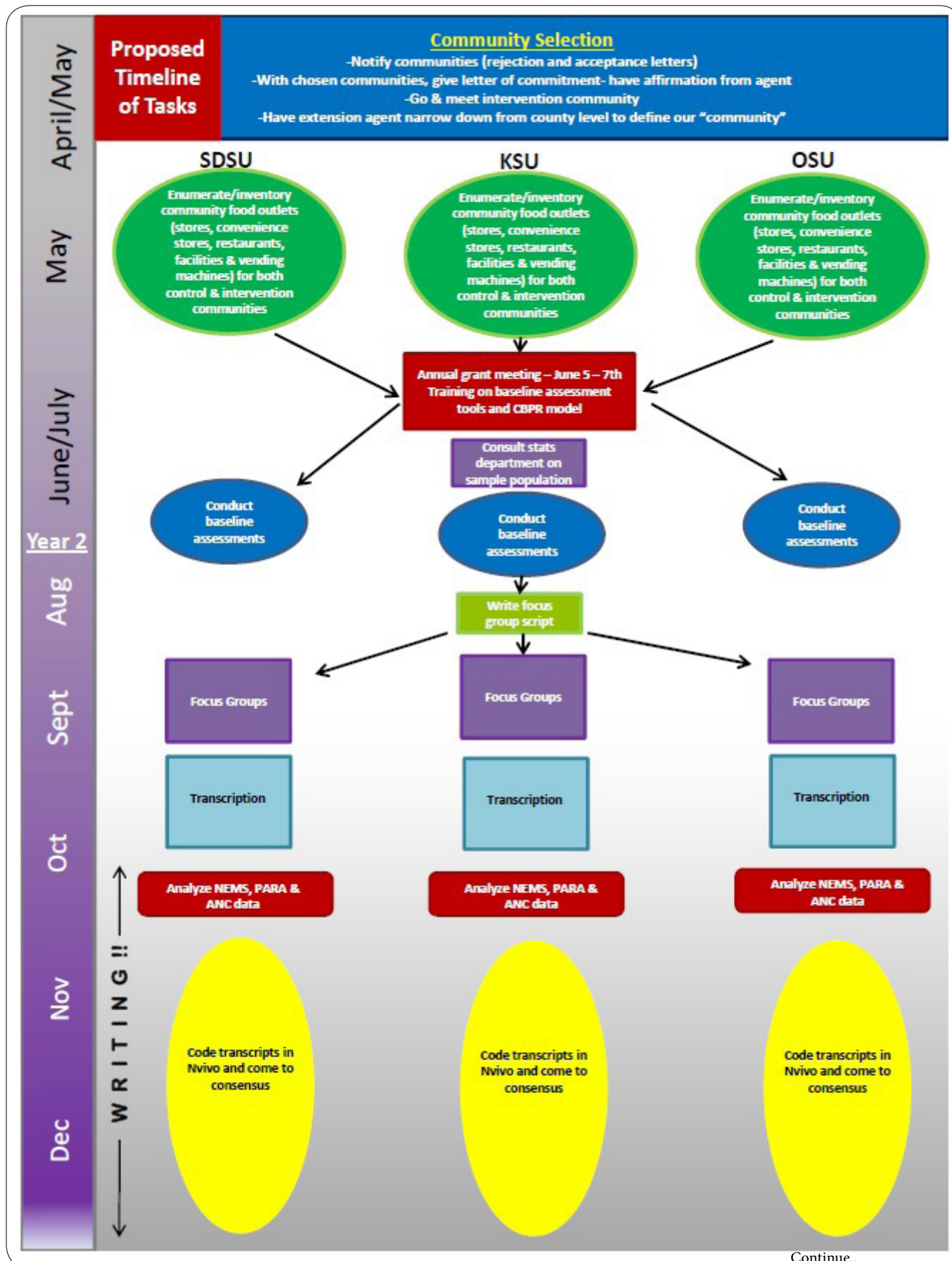
Figure 1 and Table 1 show a timeline of tasks as they relate to study design and objectives. Baseline and post-environmental data and pre- and post- questionnaire data will be analyzed using t-tests, chi-square, and ANOVA with a $p < 0.05$ to establish statistical significance. This study has been approved by each university's Institutional Review Board.

		Milestones
Year 1	<ul style="list-style-type: none"> Hire Program Coordinator Identify, adapt and/or develop assessment tools Develop focus group scripts Choose 2 communities in each state, 1 control and 1 intervention Hire Program Manager in each state Train Program Manager in Community-Based Participatory Research 	<ul style="list-style-type: none"> Staff hired Tools developed Communities chosen Training provided to intervention communities
Year 2	<ul style="list-style-type: none"> Complete assessments and focus groups On-going support and training, as needed, for intervention communities 	<ul style="list-style-type: none"> Pre-assessments completed
Year 3	<ul style="list-style-type: none"> Begin implementation of at least one nutrition and one physical activity intervention Interventions start Continue on-going support and training, 	<ul style="list-style-type: none"> Interventions implemented
Year 4	<ul style="list-style-type: none"> Interventions continue Begin post-assessments 	<ul style="list-style-type: none"> Interventions continue Post-assessments begun
Year 5	<ul style="list-style-type: none"> Complete post-assessments Analyze data Organize findings into "Best Practices" for dissemination Research manuscripts and conference proposals begun Provide training to control sites 	<ul style="list-style-type: none"> Post-assessments completed Data analysis completed and disseminated Best practices identified and available on-line

Table 1: Project Timeline and Milestones.

Community selection

A request for proposals (RFP) will be prepared and disseminated via each state's Cooperative Extension network for communities that meet low-income and minority eligibility criteria. The researchers define "low-income" if the community meets one of the following definitions: county/community household income average is below



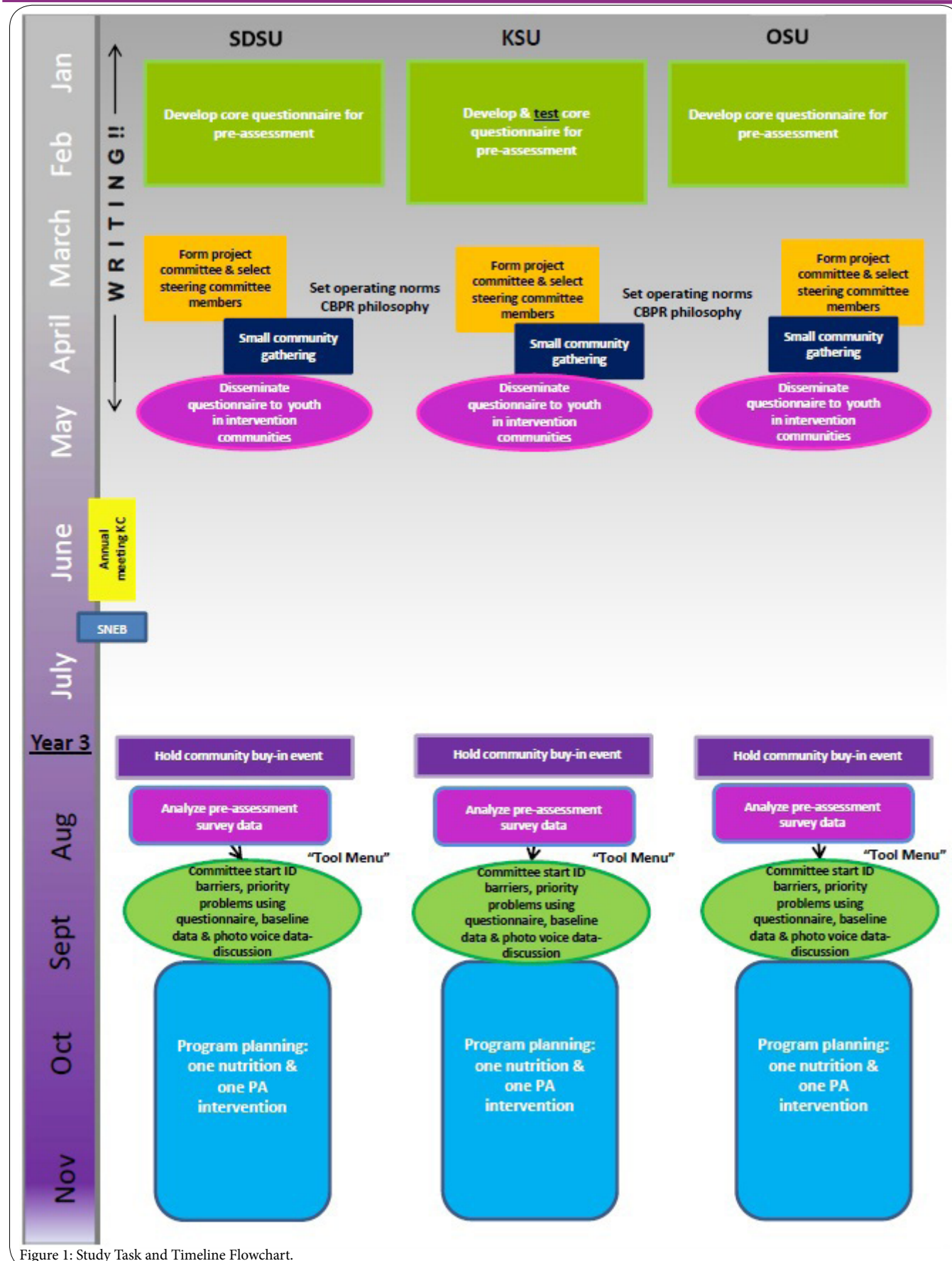


Figure 1: Study Task and Timeline Flowchart.

185% federal poverty level, county/community poverty level is higher than state average, county/community percentage of those who qualify for free or reduced-priced school lunches was higher than state average, or the majority (51% and above) of county/community residents qualify for free or reduced-priced school lunches. The researchers define "minority" if the community meets one of the following definitions: county/community had higher than the state average of non-Caucasian residents, or the majority (51% and above) of the county/community is comprised of non-Caucasian residents. Applications will be reviewed by the researchers. Two communities per state, matched for size and income guidelines, will be chosen to participate and randomly assigned to either the experimental or control group.

Baseline assessment and analysis: tool selection and methodology

Researchers' selected validated tools to assess baseline and post-intervention food environments include the Nutrition Environment Measures Survey for Stores (NEMS-S), Restaurants (NEMS-R) and vending machines (NEMS-V) to assess accessibility (availability and cost) and promotion of healthier food choices. The healthier food choices include lower calorie and lower fat restaurant options, smarter beverage choices, fresh, frozen and canned fruits and vegetables, whole grain products and lower fat meats, dairy and bakery items. Nutrition Environment Measures Survey (NEMS) was selected for use in the assessment of community food environments since it has previously been used in projects with similar aims and has been validated [19].

Validated tools selected to assess physical activity environments include the Physical Activity Resource Assessment (PARA) and the Active Neighborhood Checklist (ANC). These tools were chosen by researchers due to their multi-aspect assessment of many important factors pertaining to the built environment on physical activity levels, their ease of completion, and they were the most applicable to a variety of settings (frontier, rural and urban). PARA will be used to observe features, amenities and incivilities of recreational spaces, and community parks [20]. The ANC tool will be used to assess street-level features such as the availability and condition of sidewalks and roads, land use, lighting, and the walkability or bikeability of community street segments [21].

The food and physical activity environmental assessments will be conducted by researchers who have been trained on the selected tools. Data will provide a perspective on community environment, unveil areas for improvement and can measure any food and physical activity environmental change that may occur in these outlets throughout the life of the project.

Focus groups

The use of qualitative data from focus groups can be an effective way of gathering opinions from participants about the diversity of their views and experiences [22,23]. All three states will conduct focus groups with adolescents, parents and community stakeholders in their experimental communities to gather information on opinions, barriers, facilitators and ideas related to healthy eating and physical activity. Researchers will develop moderators' guides for youth and adults under the socio-ecological model (SEM) framework and literature focused on adolescent health behaviors [24]. The guides will be used by trained focus group moderators and co-moderators. Focus groups will be recorded, transcribed verbatim and coded by three independent coders per state before a consensus of themes is met. Results from the focus groups will be summarized and reported back to the communities.

Questionnaire

Data from focus groups will be used to guide the researchers in the selection of instruments to capture current youth health behaviors, determinants of those behaviors (perceptions, barriers, and facilitators), and youth empowerment. Each state will deliver the same questionnaire; however, each state will be allowed to add one section to query community behavior of interest. The questionnaire will be cognitively tested in each state, including their state-specific questions, with a convenience sample of 6th-8th grade youth for comprehension, content, organization and general feedback. The questionnaire will then be administered to consenting community youth pre- and post-intervention in all states. Participants who completed the pre-assessment will be contacted to complete the post-assessment to allow for data from the same individual to be paired. Also, the post-assessment will be administered to current community 6th-8th grade youth for a cross-sectional analysis related to fruit and vegetable intake, physical activity behavior and youth empowerment.

Strengths and Limitations

Many of the strengths and limitations of community-based models are inherently related.

Projects founded on community partnerships require substantial researcher time and effort in the creation and maintenance of positive academic-community relationships. The returns that result from the time invested are more impactful, appropriate and sustainable interventions.[16] Each project is fully realized within the context of the community resulting in effective interventions, but the specificity of interventions may limit its ability to be generalizable to other communities.

Project-specific strengths include the partnering of existing state Extension networks to facilitate project steps and potential continuation once funding has ended. The project's multistate design strengthens the potential for data to be more widely applied. Furthermore, this project will engage minority youth in planning and implementation; thus valuing often underrepresented voices, in addition to creating space for youth involvement and leadership.

This project has some limitations as well. These limitations include the chosen method of RFP dissemination to be sent solely via state Cooperative Extension networks. This approach could allow for the potential exclusion of qualified communities who do not have a strong Extension presence since Extension networks are highly variable state-to-state. Choosing to assess only physical environmental aspects versus social, political or cultural aspects will lead to the inability to measure the change in those areas. Lastly, the decision to not conduct focus groups in the control communities was made to minimize community interaction with researchers. The overall aim of the project is to determine community-focused best practice model for sustainable and effective adolescent obesity prevention programs that could be widely disseminated across national Cooperative Extension networks for other communities to utilize.

Competing Interests

The authors declare that they have no competing interests

Acknowledgements

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2012-68001-19619.

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This article was originally published in a special issue:

Community-Based Participatory Research Practices

Handled by Editor(s):

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